PATENTS

IN THE UNITED STATES PATENT & TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application:	10/682,601	Examiner:	Brian P. Whipple
Filed:	October 9, 2003	Art Unit:	3713
Inventor:	Clubb et al	Atty Ref.:	1160215-0509834

Title: **SYSTEM AND METHOD FOR WORK MANAGEMENT**

APPEAL BRIEF

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to an invitation to correct for non-compliance, mailed March 11, 2008, Applicant has amended section V.B of this Appeal Brief according to the instructions provided therein. In support of Applicants' appeal, filed December 26, 2007, relating to the above-captioned patent application ("Application"), please consider the following.

I. Real party in interest.

The real party in interest for the present application is Convergys Information Management Group, Inc. (CIMG). CIMG is the assignee of record per an assignment filed on October 9, 2003, by all of the inventors, to CIMG. This assignment was recorded on March 8, 2004, on Reel/Frame 015059/0238.

II. Related appeals and interferences.

To the best of Applicant's knowledge, there are no appeals or interferences which would directly affect, or be directly affected by, or have a bearing on the Board's decision in the present appeal. Applicant notes, however, that there are several related applications pending within this family including, but not limited to, Serial No. 10/682,663 (S/M for Revenue and Authorization Management) and Serial No. 11/197,597 (Architecture for a System and Method for Work and Revenue Management).

III. Status of the claims.

Claims 1-22 were originally filed in the present application.

Claims 1, 4, 13, 19, 20, and 22 were amended in a response filed March 13, 2007.

Claims 1-22 are currently pending in the present application and are under final rejection. All of the claims are the subject of the present appeal and are set forth in the Appendix (Section VII) of this Brief.

IV Status of amendments.

Prior to the final rejection in this application, amendments were submitted on August 17, 2007. These amendments have been entered. No amendments have been submitted since then in this application.

V. Summary of Claimed Subject Matter.

The present invention, as defined by the claims, improve work management by logically partitioning the physical servers present in a given system to divide a computer system into multiple sets of resources for the purpose of processing consumer transaction requests. *See*, Application at [0027]. Thus, there are a smaller number of physical processing threads which are mapped up to a larger number of logical servers. *See,* Application at Figures 5 and 7 and [0105, 0148]. The logical servers are mapped to an underlying physical machine and a Work Manager oversees the distribution of work across a pool of physical servers. *See*, Application at [0128; 0140]. The oversight provided by the Work Manager may include partitioning of work, introduction of new servers, controlled shutdowns, etc. *See*, Application at [0140]. Furthermore, the logical servers may be re-mapped particularly when a new server may be added to the overall system. *See,* Application at [0048, 0131]. Using this methodology provides multiple benefits including, but not limited to, efficiently transacting upgrades to a computer system because it is not necessary to migrate the entire datastore/processor load at once. By migrating logical servers (as opposed to physical servers), the system may be upgraded partition by partition and experience less or no downtime with less expense than would be required by a monolithic, un-partitioned system. *See,* Application at [0011, 0053].

Additional efficiencies are achieved by executing certain work together that may be 'marked' to execute on the same logical server and use the same logical database. For example, the external IDs (IMSI, phone number, e-mail addresses) for a family would be marked with the same Logical Consumer Server number so that all requests are routed to be processed on the same Logical Consumer Server (i.e., 927), and, typically, all the product and wallet instances associated with a family would be stored in the same Logical Data Store and all of the events in the same Logical Event Store. A large corporate entity, however, may have one or more dedicated logical servers and databases, that may for example cross a number of physical databases. *See,* Application at [0130].

A. Grouping of Claims

Applicant suggests the following grouping of claims for the present appeal:

Group I: Claims 1-4, 6, 11, 13-16.

Group II: Claim 5, 7-10, 12, and 22.

Group III: Claims 17-21.

The arguments for why these groups of claims are separately patentable are set forth in detail in the Argument portion of this brief.

B. Antecedent Basis

Group I is supported by, but not necessarily limited in scope by, the disclosure of paragraphs [0027], [0105], [0124], [0128], [0130], [0140], [0148], and Figures 5 and 7, among others, in the present specification as originally filed.

Group II is supported by, but not necessarily limited in scope by, the disclosure of paragraphs [0011], [0048], [0053], [0131] and [0140] among others, in the present specification as originally filed.

Group III is supported by, but not necessarily limited in scope by, the disclosure of paragraphs [0123], [0126] and [130].

More specifically, with regard to each of the independent claims identified by the notice of non-compliance (1, 17, 18, 22), please find antecedent basis for each limitation in bold in the following.

1. A distributed computer system comprising:

    a. at least one physical node; **[0105]**

    b. at least one logical node; **[0105]**

    wherein

    - each of one or more of said at least one logical node may be mapped back to one of said at least one physical node; **[0105, 0128, 0131, 0148; Figure 7]**
    - said system comprises computer executable instructions for performing a method comprising the steps of:

- receiving a request for work; **[0104; Figure 17]**
- examining said request for work; **[0104; Figure 17]**
- determining which of said at least one logical node corresponds with said request (*corresponding logical node*); **[0104-0105]**
- determining which of said at least one physical node said corresponding logical node is associated with (*corresponding physical node*); **[0104]**
- routing said request for work to said corresponding physical node; **[0104]**
- processing said request for work on said corresponding logical node. **[0111, Figures 26-28]**

17. A computerized system comprising a computer readable medium having computer executable instructions for transacting requests over a network comprising at least one physical server

wherein said physical server is subdivided into a plurality of logical servers **[0105; 0123-0124; Figure 7]**

wherein each of said plurality of logical servers is associated with a group of consumer identifiers and **[0105]**

wherein said computer executable instructions are configured to route a request, further comprising a consumer identifier, to a logical server whose range of consumer identifiers include said consumer identifier associated with said request. **[0126]**

18. A computerized system comprising a computer readable medium having computer executable instructions for transacting requests over a network comprising at least one physical server

wherein said physical server is subdivided into a plurality of logical servers **[0105; 0123-0124; Figure 7]**

wherein each of said plurality of logical servers may be associated with at least one entity and wherein said computer executable instructions are configured to route a request, **[0130-0131]** wherein said request is also associated with a particular entity, to a logical server whose range of entities includes said entity associated with said request. **[0126]**

22. A method for distributing a workload, which utilizes a plurality of physical and logical servers, comprising the steps of:

- receiving a request for work at a processing node; **[0104; Figure 17]**
- examining said request for an identifier; **[0104; Figure 17]**
- determining a logical server out of said plurality of logical servers which has been configured to accept requests associated with said identifier (*selected logical server*); **[0104-0105]**
- determining a physical server associated with said selected logical server (*associated physical server*); **[0104-0105]**
- routing said request to said associated physical server; **[0104]**
- processing said request on said selected logical server; **[0111, Figures 26-28]**
- monitoring said plurality of physical servers for said workload to exceed a predetermined maximum on any of said plurality of physical servers; **[0140]**
- redistributing a mapping of said logical servers to said physical servers to achieve a workload balanced according to a predetermined formula. **[0048]**

C. Concise Summary of Claim Groupings

Group I is directed to a system for improving work management by logically partitioning the physical servers present in a given system to divide a computer system into multiple sets of resources for the purpose of processing consumer transaction requests. *See*, Application at [0027]. Furthermore, the partitioning used by one aspect of the system (i.e., databases) does not necessarily track partitioning used in other parts of the system (900) (i.e., processors). *See,* Application at

[0124]. Finally, logical servers may be allocated based on a variety of corporate or family groupings via a consumer identifier. *See*, Application at [0105] and [0130].

Group II, with the exception of Claim 22, depends from Group I but focuses on utilizing the logical servers to migrate and remap such logical servers to their underlying physical counterparts. Such migration and remapping might be desirable when a new physical server is added to the system and/or when workload on a given physical server exceeds or descends below a predetermined limit.

Group III maximizes the efficiency of the overall system by grouping certain entities on the same logical units (e.g., family or corporate units).

IV. Grounds of Rejection to be Reviewed on Appeal

The following references have been relied on by the Examiner in formulating the rejections:

U.S. Publication No. 2003/0177232 (Coughlin)
U.S. Patent 6,272,523 (Factor)
U.S. Patent 6,880,002 (Hirschfield)
U.S. Patent 6,963,897 (Hubbard)

Claims 1-4, 6, 11, and 13-15 (Group I) are rejected under 35 U.S.C. 102(e) as being allegedly unpatentable in light of Coughlin. Claim 16 is rejected under 35 U.S.C. 103(a) as being allegedly unpatentable in light of Coughlin in view of Factor.

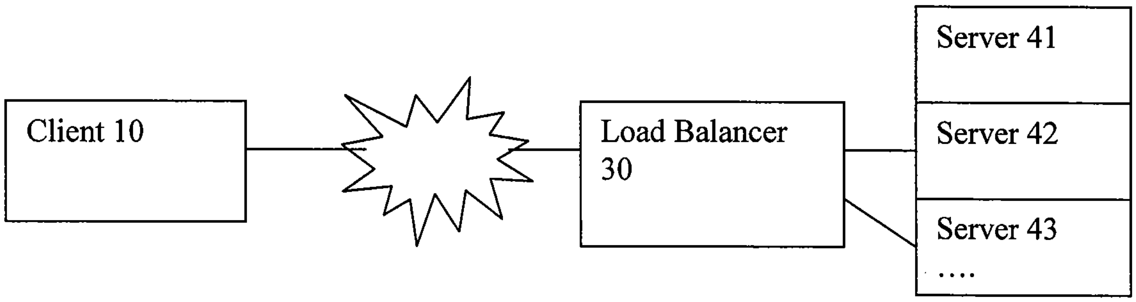
Claims 5, 7-10, 12 (Group II) are rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Coughlin in view of Factor. Claim 22 (Group II) is rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Hirschfield in view of Factor.

Claims 17-18 (Group III) are rejected under 35 U.S.C. 102(e) as being allegedly anticipated by Hirschfield. Claims 19-21 (Group III) are rejected under 35 U.S.C. 102(e) as anticipated by Hirschfield and/or under 35 U.S.C. 103(a) as obvious over Hirschfield in view of Hubbard.

The patentability of the suggested claim groupings is addressed extensively in the brief herein. None of the references cited by the Examiner teach or suggest the partitioning of physical servers into a multitude of logical servers for the purpose of processing consumer transaction requests. Further, the cited references do not teach or suggest the use of partitioned logical datastores. Finally, none of the cited references teach the association of specific entity ranges (e.g., family or corporation) to specific logical servers for the purpose of transacting request more efficiently.

Coughlin

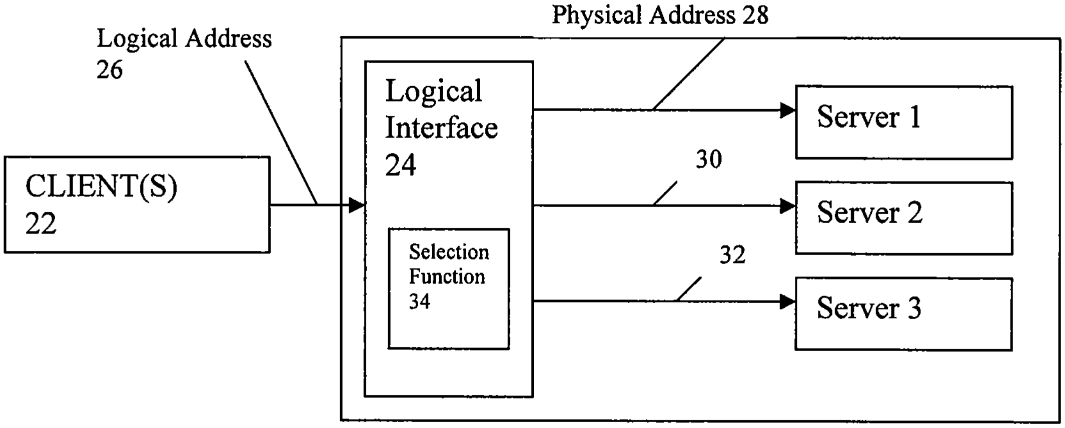
The Coughlin reference teaches a logical load balancer (30) that is merely a routing mechanism to the physical node (41, 42, 43, etc.) where content is procured. *See*, Response to December 18, 2006, Office Action at page 14 (RESP to DEC 2006 OA).



Coughlin - Figure 1

Factor

Likewise, the Factor reference teaches a load balancer that is merely a routing mechanism to the physical node where content is procured. *See*, Response to December 18, 2006, Office Action at page 14 (RESP to DEC 2006 OA). It is particularly important to note the **processing flow** in this system is, again, from a logical interface (24) **to** physical servers 1-3, etc.



Factor - Figure 2

It is also important to note that the processing flow depicted by Factor is **identical** to the processing flow depicted by Coughlin.

Hirschfield

The Hirschfield reference teaches a solution to dealing with the constraints of remote access offered by such vendors as Citrix MetaFrame, Symantec pcAnywhere, etc. (*See,* Hirschfield, Col 1: 35-40).

> "The virtualized logical server cloud may include a user database that includes mapping information between users, the logical servers and the physical servers. The server cloud manager may include a user interface that enables access and control of any one or more of the physical and logical servers by users. The server cloud manager receives **user credential information via the user interface and provides control and access** of one or more of the

> physical and logical servers employing the user database." (*See*, Hirschfield, Column 3: 12-20) (emphasis added).

This description, cited by the Examiner in the September 2007 Final Rejection (SEPT 2007 FR), refers to **security protocols** to ensure that a given user **may access** a set of resources in the logical server cloud.

The Examiner also cites Hirschfield, Figure 2 (copied below) and Column 6:64-7:62 which includes the following (emphasis added):

> [V]irtually all significant processing occurs at the logical server 106 rather than the terminal 105.... **the user may access one or more logical servers 106 based on permission.** In one embodiment, **the user interface 104 displays a stack of logical server graphics, each representing a corresponding one of the logical servers 106 that the user has permission to access. The user then interfaces the logical server graphics (e.g. point and click) to login to or otherwise control a selected logical server.**

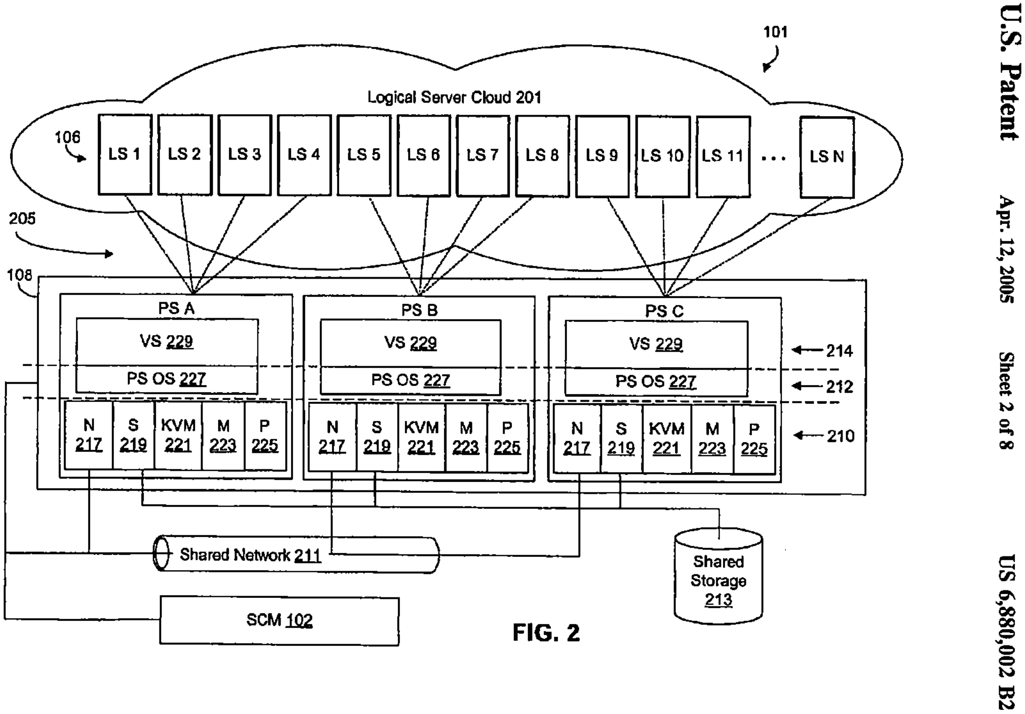


FIG. 2

Hirschfield - Figure 2

Hubbard

Finally, the Hubbard reference teaches determining and scheduling operations for workloads in a distributed processing system (but not one that is based on partitioning physical resources into logical units). Specifically, "when the agent determines that there is unused processing or other capabilities, the agent may take advantage of it. For example, if the user is using a word processing application to create a document, little processing power is being utilized by the word processing program, leaving the computer's CPU and video processor underutilized. Thus, the agent could execute commands to these processors during **dead cycles**. In this way, the agent may facilitate the completion of workload processing in a reduced time. *See*, Hubbard - Column 9: 10-20 (emphasis added). It should be noted that nothing in this application discusses the use of partitioning physical servers into logical servers.

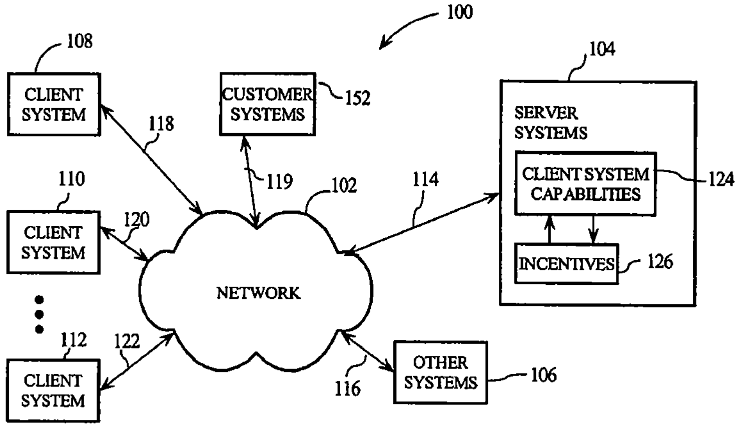


FIG.1A

Hubbard – Figure 1A

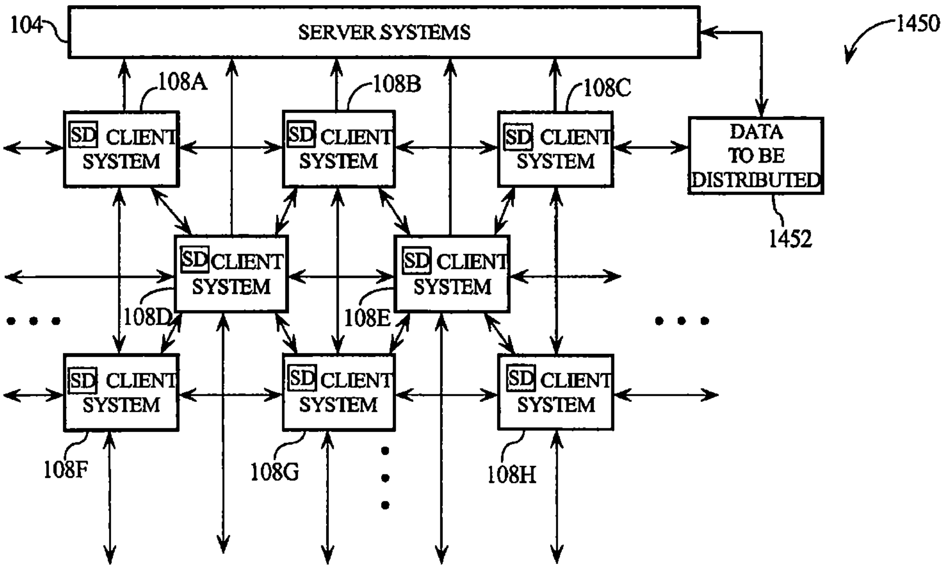


FIG. 14B

Hubbard – Figure 14B

V. Argument

The claims of the present invention are novel under 35 U.S.C. 102(e) and not obvious under 35 U.S.C. 103(a).

35 U.S.C. 102(e) provides that a person shall be entitled to a patent unless the invention was described in an application for patent published before the invention by the applicant.

35 U.S.C. 103(a) provides that a patent may be obtained so long as "the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." Applicants note that under MPEP 2143, three basic criteria must be met in order to establish a *prima facie* case of obviousness.[1] First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Finally, the art must carry a reasonable expectation of success if the combination or modification is made. In the recent Supreme Court decision in KSR International Company v. Teleflex Incorporated, 127 S. Ct. 1727 (2007), the Court stated that a court must determine whether an alleged invention "is more than the simple substitution of one known element for another or the mere application of a known technique to a piece of prior art ready for the improvement." In response, the USPTO has defined several rationales (*see,* MPEP 2143) to support an obviousness rejection. Each, of these rationales has a specific formula (outlined below) which, when followed, do not support a conclusion that the claims of the present invention are obvious.

A. Combining prior art elements according to known methods to yield predictable results
    1. a finding that the prior art included each element claimed, although not necessarily in a single prior art reference, with the only difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;
    2. a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately;
    3. a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable;

B. Simple substitution of one known element for another to obtain predictable results

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[1] MPEP § 2143.

    1. a finding that the prior art contained a device (method, product, etc.) which differed from the claimed device by the substitution of some components (step, element, etc.) with other components;
    2. a finding that the substituted components and their functions were known in the art;
    3. a finding that one of ordinary skill in the art could have substituted one known element for another, and the results of the substitution would have been predictable;

C. Use of known technique to improve similar devices (methods, or products) in the same way;

    1. a finding that the prior art contained a "base" device (method, or product) upon which the claimed invention can be seen as an "improvement;"
    2. a finding that the prior art contained a "comparable" device (method, or product that is not the same as the base device) that has been improved in the same way as the claimed invention;
    3. a finding that one of ordinary skill in the art could have applied the known "improvement" technique in the same way to the "base" device (method, or product) and the results would have been predictable to one of ordinary skill in the art;

D. Applying a known technique to a known device (method, or product) ready for improvement to yield predictable results

    1. a finding that the prior art contained a "base" device (method, or product) upon which the claimed invention can be seen as an "improvement;"
    2. a finding that the prior art contained a known technique that is applicable to the base device (method, or product);
    3. a finding that one of ordinary skill in the art would have recognized that applying the known technique would have yielded predictable results and resulted in an improved system; and

E. "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

    1. a finding that at the time of the invention, there had been a recognized problem or need in the art, which may include a design need or market pressure to solve a problem;
    2. a finding that there had been a finite number of identified, predictable potential solutions to the recognized need or problem;

3. a finding that one of ordinary skill in the art could have pursued the known potential solutions with a reasonable expectation of success; and
4. whatever additional findings based on the Graham factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

F. Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;

1. a finding that the scope and content of the prior art, whether in the same field of endeavor as that of the applicant's invention or a different field of endeavor, included a similar or analogous device (method, or product);
2. a finding that there were design incentives or market forces which would have prompted adaptation of the known device (method, or product);
3. a finding that the differences between the claimed invention and the prior art were encompassed in known variations or in a principle known in the prior art;
4. a finding that one of ordinary skill in the art, in view of the identified design incentives or other market forces, could have implemented the claimed variation of the prior art, and the claimed variation would have been predictable to one of ordinary skill in the art;

G. Some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention.

1. a finding that there was some teaching, suggestion, or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings;
2. a finding that there was reasonable expectation of success.

Other Graham factors may be considered under each of the above rationales.

Group I

The Examiner erroneously rejected claims 1-4, 6, 11, and 13-15 citing Coughlin under 35 U.S.C. 102(e). The Examiner further erroneously rejected claim 16 as being obvious under 35 U.S.C.

103(a) citing Coughlin in view of Factor. Collectively, these claims have been designated Group I. As stated previously, Group I is directed to a system for improving work management by **logically partitioning** the physical servers present in a given system to divide a computer system into multiple sets of resources for the purpose of processing consumer transaction requests.

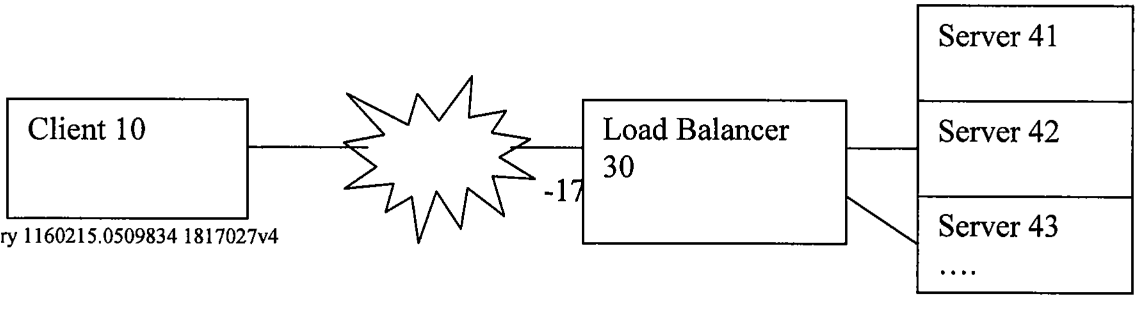
Group I – 102(e) Rejection

Coughlin does not anticipate claims 1-4, 6, 11, and 13-15 under 35 U.S.C. 102(e) because this published patent application does not disclose each limitation present in those claims. For ease of evaluation, the arguments will be discussed in the context of Claims 1 and 13-14, however, where the dependency is broken (through a new independent chain), the limitations discussed with regard to Claim 1 are substantially similar to the other claims in this grouping.

Claim 1

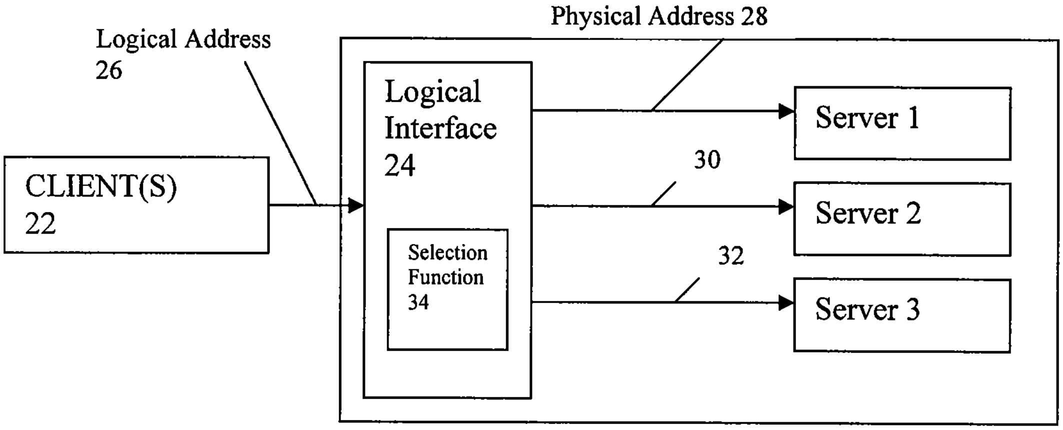
The argument here is quite similar to that included in the RESP to DEC 2006 OA, at page 3, with regard to a rejection based on Factor. In that response, the Applicant made amendments to clarify that the work request flows **from** the physical node **to** the logical node where it is processed. Factor teaches the opposite type of work request flow.

The Examiner indicated that his previous rejection was rendered moot in light of the amendments made and new grounds of rejection in the Office Action, dated April 12, 2007 (APRIL 2007 OA), (*see*, page 2) which cited Coughlin as the primary reference. However, as described in the treatment of the references above, Coughlin and Factor disclose the same type of processing flow. A comparison of the figures from both Factor and Coughlin render this statement indisputable.



35 U.S.C. 103(a)

Coughlin – Figure 1



Factor – Figure 2

Furthermore, the Examiner tacitly recognized this in the April 2007 OA by stating at #14, "As to Claim 1, Coughlin discloses a distributed computer system comprising … at least one logical node (Fig. 1, item 30); the load balancer receives the request from a client and returns a result, **but does not do the actual processing, thus it is a logical node.** [Emphasis added]. This is in direct contravention to the claim limitation in Claim 1 which states "processing said request for work on said corresponding logical node" (bolded and copied below):

1. (Currently Amended) A distributed computer system comprising:

    c. at least one physical node;

    d. at least one logical node;

    wherein

    - each of one or more of said at least one logical node may be mapped back to one of said at least one physical node;

- said system comprises computer executable instructions for performing a method comprising the steps of:
  - receiving a request for work;
  - examining said request for work;
  - determining which of said at least one logical node corresponds with said request (*corresponding logical node*);
  - determining which of said at least one physical node said corresponding logical node is associated with (*corresponding physical node*);
  - routing said request for work to said corresponding physical node;
  - **processing said request for work on said corresponding logical node.**

In a later communication, the Examiner disagreed that Coughlin teaches the same processing flow as Factor by stating, "a request for web content is sent from a load balancer to a selected server, relevant web content is sent from the server to the load balancer, and then the load balancer processes the request by either sending verified web content to client or if the web content is not valid, selecting a different server. Thus, the flow for work request goes from the logical node to the physical and back to the logical node. (*See*, Office Action, dated September 25, 2007 at # 4). Again, the Examiner's own statements prove the difference between the prior art cited and the present invention. To wit, the Examiner stated that Coughlin discloses "client → logical → physical → logical". The present application claims the following flow "client → physical → logical". The presently claimed flow is reflected in claim 1 as follows (note the steps outlined in the claim are not in sequential order): receiving a request for work; routing said request for work to said corresponding physical node; determining which of said at least one logical node corresponds with said request (*corresponding logical node*); processing said request for work on said corresponding logical node.

Therefore, Coughlin is merely cumulative of the original Factor reference and the rejection based on Coughlin should be withdrawn as to claims 1-4, 6, 11 and 13-15.

Claims 13-14

The Examiner further erroneously cited Coughlin against Claims 13-14 for the premise that this prior art reference disclosed remapping said corresponding logical servers, in response to a server failure, across a set of remaining physical servers according to a predetermined pro-rata formula.

There is no discussion of "remapping said corresponding logical servers across a set of remaining physical servers" in Coughlin. Paragraphs [0016] and [0021], cited by the Examiner in the SEPT 2007 OA, disclose the following (emphasis added):

> [0016] **At function 110, load balancer 30 selects one of servers 41-45 based on known load balancing algorithms or techniques.** These algorithms typically distribute URL requests or queries equitably among servers 41-45 in order to amortize load and **improve availability by avoiding downed servers.** The Web request is then forwarded to the selected server.
>
> [0021] If at function 140 it is determined that the Web content is not valid, multiple actions may be taken at function 150. One action is to send an e-mail to an administrator to alert the administrator that the server has been hacked, or otherwise report the status of the server. **Another action is to mark the server that sent the invalid content as "dead", and have load**

balancer 30 redirect the Web request from function 100 to one of the remaining servers at function 160. All future Web requests received by load balancer 30 would then be re-balanced to exclude the dead server, until the server is corrected.

These passages relate to ongoing requests and the ability of Coughlin's load balancer to adjust its balancing algorithm to react to a "downed server" (one which has been determined to provide suspect content). Coughlin does not, however, discuss remapping in the sense of a failed server where it would be necessary to transport data/processing requests resident on a failed physical server over to another physical server. This is a different problem and a different solution is provided to solve it in the present Application. Coughlin's only capability to is adjust ongoing requests to avoid a particular physical server but it cannot remap the workload across a set of logical servers because Coughlin does not even have a bank of logical servers as described in the present Application. Again, the flow of Coughlin goes from client → logical → physical. The bank of servers present in Coughlin is entirely physical so the routing (not remapping) that occurs in Coughlin is only across the bank of physical servers.

Because at least one limitation from each of Claim 13 (remapping **logical servers** if a physical server fails) and Claim 14 (conducting such remapping based on a pro-rata formula) is missing, the Coughlin reference fails to anticipate these claims. Therefore the rejection based on Claim 13 and 14 should be withdrawn.

Group I – 103(a) Rejection

The Examiner also erroneously rejected claim 16 based on a combination of Coughlin and Factor (CF COMBO). The Examiner alleged that "Coughlin discloses the invention substantially as in parent claim 6, but is silent on said request comprises at least one consumer identifier. .... However, Factor does disclose said request comprises at least one consumer identifier (Col. 4, lines 11-15).

This combination fails for, at least, the reasons documented in the prior section regarding why Coughlin does not anticipate the base claims of this invention. Coughlin's combination with Factor does not ameliorate the deficiencies of the Coughlin reference cited above as it is missing several elements of the pending claims.

Given the lack of so many limitations in the independent claims, it is clear that the combination of prior art elements described in Coughlin and Factor do not yield the invention (MPEP § 2143 (A)). Therefore, the prior art does not include each element claimed (most notably the particular processing flow of "client → physical → logical"). Even combining the Coughlin and Factor, one of ordinary skill could not have formed this processing flow. Indeed, the claimed processing flow represents an inversion of the prior art flow ("client → logical → physical") which is exemplified by both Coughlin and Factor. Given this, it is unnecessary to debate whether the results of the combination would be predictable or, rather, they would be entirely predictable as the two prior art references operate in the same manner and not in the manner of the presently claimed invention.

Furthermore, this is clearly not a simple substitution of one known element for another. (MPEP § 2143 (B)) as the prior art represents an entirely different paradigm from the presently claimed invention.[2] Therefore, the prior art combination does not contain a device/method which differs from the claimed device by a mere substitution of components. As has been argued, the CF COMBO does not render the present invention obvious. Furthermore, one of ordinary skill in the art would not be able to create the claimed invention by substituting any components of Factor for Coughlin as these references share the same processing flow and do not add the missing claim limitations via their combination.

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[2] An argument regarding obviousness of a claim may be rebutted by showing that the art, in any material respect, teaches away from the claimed invention. In re Geisler, 116 F.3d 1465, 1471, 43 USPQ2d 1362, 1366 (Fed. Cir. 1997).

Next, as the hash value disclosed by Factor does not do anything to remedy the underlying deficiencies of Coughlin, it is not an improvement of that reference for purposes of obviousness. (MPEP § 2143 (C-F)). Therefore, the prior art does not contain a base device upon which the claimed invention can be seen as an improvement nor do Coughlin or Factor contain a comparable device that has been improved to include the processing flow of the claimed invention. Furthermore, notwithstanding the foregoing, it is a difficult proposition that one of ordinary skill in the art would recognize applying a known technique to a known device (method, or product) ready for improvement to yield predictable results or that there was a recognized problem or need in the art, which may include a design need or market pressure to solve a problem, as the primary reference, Coughlin, was filed mere months ahead of the present application (Coughlin's filing date was March 18, 2002, as compared to the present application's provisional application filing date of October 9, 2002).

Also, neither Coughlin or Factor would inherently prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art as, again, the present application represents a paradigm shift in processing flows. Even if one were to broadly cast the field of endeavor while recognizing the ever-present drive to improve computer processing to be faster, more efficient, etc., the Examiner has not provided any explanation in this rejection which would suggest that the present invention could have been arrived at via the combination of Factor, Coughlin and some other piece of prior art comprising known variations. The complete architectural and processing reversal of

Factor/Coughlin, as compared to the presently claimed invention, foreclose the combination of these two systems with any other art to render the current claims obvious.

Finally, there is no teaching, suggestion, or motivation in the combination of Coughlin and Factor that would have led one of ordinary skill in the art to modify the Coughlin reference to provide the "client → physical → logical" process flow of the current invention and claims. Nor has the Examiner provided any such justification for his rejection.

Therefore, the rejection of Claim 16 should also be withdrawn.

Group II

The Examiner erroneously rejected claims 5, 7-10, 12 (Group II) under 35 U.S.C. 103(a) as being allegedly unpatentable over Coughlin in view of Factor. Claim 22 (Group II) was wrongly rejected under 35 U.S.C. 103(a) as being allegedly unpatentable over Hirschfield in view of Factor.

Coughlin in view of Factor

The Examiner's rejection based on Coughlin in view of Factor is flawed for much of the same reasons already discussed above. As previously discussed, the process flow claimed in the present application goes from "client → physical → logical". This next subset of claims (Group II) extends this model by utilizing the logical servers to migrate and remap such logical servers to their underlying physical counterparts. For purposes of focusing the underlying argument, Applicant will focus on Claim 5 as representative of the Group II claim set.

The Examiner states in the SEPT 2007 FR that Coughlin is "silent on upgrading said system by performing the steps of: recognizing at least one additional physical datastore in said system wherein said additional physical datastore is different from said corresponding physical datastore (pre-existing datastore); migrating at least one logical datastore of said at least one corresponding logical datastore from said pre-existing physical datastore to said additional physical datastore;

remapping said logical datastore from said pre-existing physical datastore to said additional physical datastore."

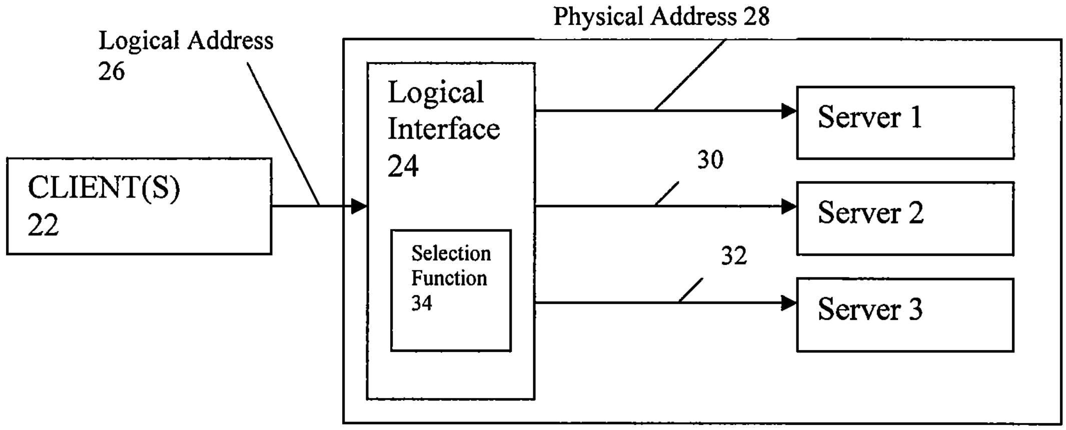
The Examiner goes on to allege that Factor discloses all of these limitations in a mere three lines of the Abstract to that patent. (*See*, SEPT 2007 FR at #25). Here is the portion cited by the Examiner (Abstract at 6-9) with the previous sentence for context:

> **Logical** processes are mapped **to physical** processes using a logical interface and may be done in a one-to-one, one-to-many, or many-to-one fashion. The mapping is dynamic in the sense that mapping decisions may include selection functions that can be changed on the fly so that servers can be added or removed in a manner that is relatively transparent to the client.

The Examiner continues, "It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Coughlin by dynamically adding physical datastores and remapping a logical datastore … as taught by Factor in order to allow for dynamic, transparent addition of physical datastores for the purposes of easily adding physical capacity and processing power to a distributed system." But, nothing in Factor discloses the limitation of "migrating at least one **logical datastore** of said at least one corresponding logical datastore from said pre-existing physical datastore to said additional physical datastore." This is apparent when the Examiner's cited portion is combined with the prior sentence in the Factor Abstract:

> **Logical** processes are mapped **to physical** processes using a logical interface and may be done in a one-to-one, one-to-many, or many-to-one fashion.

As discussed with Group I, the process flow in Factor goes from "client → logical → physical" as illustrated in Figure 2 of Factor:



Factor – Figure 2

Clearly, the mapping discussed in the Abstract is that which governs the "logical → physical" part of the Factor flow (so that the load balancer knows which of the three exemplary physical servers to send the client request). Therefore, it is nonsensical that the logical interface (24) of Factor might be migrated to a different physical server. Indeed, the logical interface (24) of Factor is merely a routing mechanism to the physical node and not a datastore at all.

Because the CF COMBO lacks the remapping of logical datastores, the rejection of claims 5, 7-10, and 12 should be withdrawn.

Hirschfield in view of Factor

The Hirschfield reference teaches a solution with regard to the constraints of remote access offered by such vendors as Citrix MetaFrame, Symantec pcAnywhere, etc. The Examiner misinterpreted the applicability of Hirschfield to the combination of Coughlin and Factor in Claim 22. Interestingly, Hirschfield is actually closer to the processing flow of the present application than either of the references discussed earlier (Coughlin and Factor) since it, at least, describes the conceptual flow of a physical server to a logical server. But, Hirschfield is directed to a different problem (remote access) and does not include any discussion of "processing said **request**[3] on said selected logical server" as the term request is defined with the present patent application's specification and as is claimed in Claim 22.[4] As discussed in the RESP APRIL 2007 OA, Hirschfield merely describes a structure for a logical server cloud but does not disclose, teach, suggest or inspire the utilization of such an architecture for consumer transaction requests, as that term is defined in the present Application. "Request" is implicitly defined in the present Application at [0021]:

> A request may include authorization requests wherein a consumer may be *requesting* permission to use or perform a certain task **(i.e., make a phone call, play a video game, access a file, utilize a machine such as a dorm washing machine with this functionality built into its interface, etc.).**

The type of requests involved in the present application differ materially from the requests involved in Hirschfield as the present application is concerned about efficient processing of **consumer transactions** whereas Hirschfield is concerned with **virtual control of a physical machine**. In Hirschfield, the type of requests processed include:

> The user interface 104 also provides interfaces to provide SCM control of the physical server. Hirschfield, Col. 7: 27-29.

Therefore, Hirschfield and the present Application are directed to solving entirely different problems: Hirschfield is concerned with security and the present Application is concerned with efficient processing of consumer transactions. While both problems are ultimately solved through the use of logical partitioning, one of skill in the art of processing consumer transactions would not have been motivated to consider remote access applications in solving the issues described in the present Application nor has the Examiner made any case to establish that one of ordinary skill in the art would have considered such a reference absent the use of hindsight.

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[3] "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

[4] Nor, for that matter, should Hirschfield affect the claims within Group I (although the Examiner did not apply Hirschfield to these claims) for the reasons espoused herein as, using Claim 1 as representative of that grouping, Hirschfield does not include the similar limitation "processing said request for work on said corresponding logical node" as the term "request for work" is defined within the present application's specification. Hirschfield also fails to disclose limitations contained in the other claims of Group I including, but not limited to the use of a logical datastore (*see*, at least, Claim 4), said at least one corresponding logical server is associated with a predetermined group of data values (*see*, at least, Claim 11), a predetermined formula comprises distributing said logical servers on a pro-rata basis across said

Furthermore, neither Factor nor Coughlin remedy this deficiency as both are directed toward load balancing across only physical servers (this point is again exemplified by the process flow of client → logical → physical). Also, neither reference discloses the processing of a request as it is defined in the present Application as Coughlin concerns comparing web server content to detect hacking and Factor concerns website access via the world wide web

Conclusion on Group II.

Given the lack of a limitation regarding the migration of logical datastores as well as the processing of a request as it is defined in the present Application (e.g., a consumer transaction such as making a phone call, playing a video game, accessing a file, utilizing a machine such as a dorm washing machine with this functionality built into its interface), it is clear that the combination of prior art elements described in Hirschfield, Coughlin, and Factor (HCF COMBO) do not yield the invention (MPEP § 2143 (A)). Therefore, the prior art does not include each element claimed nor does the HCF COMBO represent a simple substitution of one known element for another. (MPEP § 2143 (B)).

Next, the combination of Factor and Coughlin is not an improvement of Hirschfield patent for purposes of obviousness. (MPEP § 2143 (C-F)). There is simply no reason (nor has one been presented by the Examiner), absent hindsight, why one of ordinary skill in the art of processing consumer transactions would have been motivated to look at a reference dealing with remote access

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remaining physical servers (*see*, at least, Claim 14), wherein said entity comprises a family/company (*see*, at least, Claims 19-20).

(Hirschfield) to improve the load balancing techniques described in Coughlin and Factor and then add in the twist of processing consumer transactions and/or the migration of logical datastores via such a system. Conversely, there is no reason why one skilled in the art of remote access technologies, would be motivated to consider revamping the entire system to perform an entirely different function of processing consumer transactions over those logical servers and then somehow derive this from the combination of Coughlin and Factor with anything other than the use of hindsight.

Furthermore, notwithstanding the foregoing, it is a difficult proposition that one of ordinary skill in the art would have recognized applying a known technique to a known device (method, or product) ready for improvement to yield predictable results or that there was a recognized problem or need in the art, which may include a design need or market pressure to solve a problem, as one of the references in the HCF COMBO filed mere months ahead of the present application (Coughlin's filing date was March 18, 2002, as compared to the present application's provisional application filing date of October 9, 2002) and the other reference was filed just slightly over one year from the present application (Hirschfield's provisional filing date was September 5, 2001).

Also, nothing in the HCF COMBO would inherently prompt variations of it for use in either the same field or a different one based on design incentives or other market forces for the reasons already stated herein.

Finally, there is no teaching, suggestion, or motivation in the HCF COMBO that would have led one of ordinary skill in the art to modify any of these as the base reference to create the current invention.

Therefore, Applicant requests that the rejection of the Group II claims under 35 U.S.C. 103(a) be withdrawn.

Group III

Group III includes claims 17-21. These claims focus on maximizing the efficiency of the overall system by grouping certain entities on the same logical units (e.g., family or corporate units).

Claims 17-18 (Group III) are rejected under 35 U.S.C. 102(e) as being allegedly anticipated by Hirschfield. Claims 19-21 (Group III) are rejected under 35 U.S.C. 102(e) as anticipated by Hirschfield or under 35 U.S.C. 103(a) as obvious over Hirschfield in view of Hubbard.

Group III - 102(e) Rejection

Because Hirschfield is directed to a different problem (remote access), it does not include any discussion of the particular limitation recited in Claim 17 of routing a request **"to a logical server whose range of entities[5] includes said entity associated with said request".** Hirschfield is directed toward secure, remote access of a single user to a remote computer. The present application is directed toward work management so that the logical server, in the present application, may be assigned to a multitude of customer accounts. This is present in the claim language that a "range of entities" is assigned to a logical server.

As stated in the RESP APRIL 2007 OA, Hirschfield merely describes a structure for a logical server cloud but does not disclose, teach or suggest the particular computer-executable instructions which actually utilize such an entity for transacting requests over a network as that is defined by the present patent application. Hirschfield is simply a method for achieving remote access. *See*, Application at [0021].

Hirschfield is missing the claim limitation present in both Claims 17 and 18 (that the logical server is associated with a range of entities). Therefore, the rejection of Claims 17-18 should be withdrawn.

Group III - 103(a) Rejection

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[5] "All words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

Finally, the Examiner cited Hubbard in an attempt to contend that claims 19-21 were obvious over Hirschfield in view of Hubbard. Nothing in Hirschfield discusses associating a logical server with a range of entities comprising a family or a corporation. Therefore, it falls to Hubbard to remedy this deficiency. Hubbard also fails to accomplish this.

The Examiner specifically cited Hubbard, Col. 32: 55-58 in his rejection. This section needs to be combined with the previous paragraph (Col. 32: 24-35 and Figures 1A and 14B) to place it in its proper context (emphasis added):

> A client agent, as discussed above, installed on the client systems 108A, 108B, 108C, 108D, 108E, 108F, 108G and 108H includes functionality that facilitates a number of services with respect to data transmission and sharing. First, **the client agent provides a protected data storage area accessible to outside devices**, which is represented by the SD block within each client system in FIG. 14B. **This special storage space protects the device from outside devices accessing other storage areas on the device while allowing data to be shared and accessed by other devices and simultaneously used by the local client agent.** ... This would enable simple picture sharing, for example, between remote families connected via the internet, as part of being a client system within the distributed processing system of the present invention.

This does not describe a way to increase efficiency of the processing of requests/consumer transactions by associating a range of entities, such as a family or a corporation, with a specific logical partitions. Rather, Hubbard describes a method allowing multiple entities access to the same storage space.

Given the lack of a limitation regarding a "range of entities" (including a family or corporate entity), it is clear that neither Hirschfield alone nor the combination of Hirschfield and Hubbard (HH COMBO) yields the invention (MPEP § 2143 (A)). Therefore, the prior art does not include each element claimed nor is there a simple substitution of one known element for another. (MPEP § 2143 (B)).

Next, the HH COMBO is not an improvement of Hirschfield patent for purposes of obviousness. (MPEP § 2143 (C-F)). There is simply no way to arrive at the present invention by retrofitting the remote access system of Hirschfield with the ability of, say, a family to access a particular data storage location in a distributed processing system, as described in Hubbard, to arrive at a system which performs efficient processing of consumer transactions/requests through logically partitioning physical servers wherein those logical partitions are associated with a particular entity.

Furthermore, notwithstanding the foregoing, it is a difficult proposition that one of ordinary skill in the art would recognize applying a known technique to a known device (method, or product) ready for improvement to yield predictable results or that there was a recognized problem or need in the art, which may include a design need or market pressure to solve a problem, as Hirschfield was filed just over one year from the present application (the provisional filing date was September 5, 2001).

Also, neither Hirschfield or Hubbard would inherently prompt variations of each other based on design incentives or other market forces because each patent is directed toward an entirely different problem. Hirschfield deals with remote access. Hubbard deals with sharing resources in a networked environment.

Finally, there is no teaching, suggestion, or motivation in the HH COMBO that would have led one of ordinary skill in the art to modify any of these to create the current invention nor has the Examiner provided such in his prior office actions.

CONCLUSION

The prior art reference or combination of references must teach or suggest all of the limitations of a claim. MPEP 2143.03. "To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

An analysis of the references cited in the rejection of the claims under 35 U.S.C. 102(e) has shown that the prior art lacks at least one element in each of the representative claims for the three groupings in this appeal.

Furthermore, none of the rationales offered by the revised KSR Guidelines, in MPEP § 2143, support an obviousness rejection against any of the claims in this Application.

With regard to the rejections made against Groups I-III, Applicant respectfully requests that the rejections be withdrawn because the references cited are, at least, missing the following limitations from the claims as they currently exist:

- “processing said request for work on said corresponding logical node” as the term “request for work” is defined within the present application’s specification;
- a range of entities associated with a given logical server and, in particular, associating an entity such as a family or a corporation to a given logical unit;
- migration of a logical datastore;
- remapping servers according to a pro-rata formula in response to a server failure.

For the reasons set forth above, it is respectfully submitted that the claims currently pending in the present application meet the requirements of 35 U.S.C. 102(e) and 35 U.S.C. §103(a). Accordingly, it is respectfully requested that the Examiner's rejections be reversed and that the claims currently pending in the present application be indicated as allowable.

Respectfully submitted,

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VI. CLAIMS APPENDIX

CLAIMS:

2. A distributed computer system comprising:

   e. at least one physical node;

   f. at least one logical node;

   wherein

   - each of one or more of said at least one logical node may be mapped back to one of said at least one physical node;
   - said system comprises computer executable instructions for performing a method comprising the steps of:
     - receiving a request for work;
     - examining said request for work;
     - determining which of said at least one logical node corresponds with said request (*corresponding logical node*);
     - determining which of said at least one physical node said corresponding logical node is associated with (*corresponding physical node*);
     - routing said request for work to said corresponding physical node;
     - processing said request for work on said corresponding logical node.

3. A system as claimed in Claim 1 wherein:

   a. at least one of said at least one corresponding physical node comprises a corresponding physical datastore;

   b. at least one of said at least one corresponding logical node comprises a corresponding logical datastore.

4. A system as claimed in Claim 2 wherein:

   - at least one corresponding physical node comprises a corresponding physical server;

   - at least one corresponding logical node comprises a corresponding logical server.

5. A system as claimed in Claim 3 wherein:

   - said corresponding logical datastore may be associated with a first predetermined set of data values;

   - said corresponding logical server may be associated with a second predetermined set of data values;

   - said step of interacting comprises:

     - opening said corresponding logical datastore;

     - obtaining a set of additional information about said request from said datastore;

     - determining which of said at least one corresponding physical server and corresponding logical server is associated with a combination of said request and said set of additional information;

     - routing said request to said corresponding logical server;

- allowing said corresponding logical server to access and modify said corresponding logical datastore;
- processing said request on said corresponding logical server.

6. A system as claimed in Claim 2 wherein said system further comprises computer executable instructions for upgrading said system by performing the steps of:

- recognizing at least one additional physical datastore in said system wherein said additional physical datastore is different from said corresponding physical datastore (pre-existing physical datastore);
- migrating at least one logical datastore of said set of logical datastores from said pre-existing physical datastore to said additional datastore;
- remapping said logical datastore from said pre-existing physical datastore to said additional datastore.

7. A system as claimed in Claim 1 wherein:

- at least one of said at least one corresponding physical node comprises a corresponding physical server;
- at least one of said at least one corresponding logical node comprises a corresponding logical server;
- said interacting step comprises routing said request to said corresponding logical server.

8. A system as claimed in Claim 6 wherein said system further comprises computer executable instructions for performing the steps of:

a. monitoring a workload allocated to each of said at least one physical server;

b. if said workload, on any of said at least one physical servers, exceeds a predetermined maximum:

- adding at least one additional physical server to said system;
- remapping at least one of said logical servers across said at least one physical server including said additional physical server so as to redistribute said workload according to a predefined formula.

9. A system as claimed in Claim 6 wherein said system further comprises an application programming interface configured to allow a user to

- monitor a workload allocated to each of said at least one physical server;
- recognizing at least one additional physical server;
- remapping said at least one logical server across said at least one physical server including said additional physical server so as to redistribute said workload.

10. A system as claimed in Claim 6 wherein said system comprises at least two physical servers and further comprises computer executable instructions for performing the steps of:

- monitoring a workload allocated to each of said corresponding physical servers;
- if said workload, on any of said physical servers, exceeds a predetermined maximum, remapping at least one said logical servers so as to redistribute said workload according to a predefined formula.

11. A system as claimed in Claim 6 wherein said system comprises at least two physical servers and further comprises computer executable instructions for performing the steps of:

- monitoring a workload allocated to each of said corresponding physical servers;

- if said workload, on any of said physical servers, individually or in combination, falls below a predetermined minimum, remapping at least one of said logical servers so as to redistribute said workload according to a predefined formula.

12. A computerized system as claimed in Claim 6 wherein:

    a. said request comprises a data value;

    b. said at least one corresponding logical server is associated with a predetermined group of data values;

    c. said system comprises further computer executable instructions for performing the steps of:

       - obtaining said data value from said request;

       - matching said data value associated with said request with one of said at least one corresponding logical server wherein said corresponding logical server is associated with said predetermined group of data values which includes said request's data value.

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13. A system as claimed in Claim 6 wherein said system further comprises computer executable instructions for upgrading said system by performing the steps of:

    a. recognizing at least one additional physical server in said system wherein said additional server comprises at least some programming that is different from said pre-existing physical servers;

    b. migrating at least one logical server of said set of logical servers from said corresponding physical server to said additional server;

    c. remapping said logical server from said corresponding physical server to said additional server.

14. A system as claimed in Claim 6 wherein said system comprises further computer executable instructions for performing the step of:

    a. if one of said physical servers fails, remapping said corresponding logical servers across a set of remaining physical servers according to a predetermined formula.

15. A system as claimed in Claim 13 wherein said predetermined formula comprises distributing said logical servers on a pro-rata basis across said remaining physical servers.

16. A system as claimed in Claim 13 wherein said predetermined formula comprises analyzing a pre-existing workload and capacity on each of said remaining physical servers and distributing said logical servers in such a manner as to balance, as much as possible, said workload across said remaining physical servers.

16. A computerized system as claimed in Claim 6 wherein:

a) said request comprises at least one consumer identifier;

b) said at least one logical server is programmed to process a plurality of requests corresponding to a plurality of consumer identifiers;

c) said determining step is based on matching a request with a specific consumer identifier to its corresponding logical server.

17. A computerized system comprising a computer readable medium having computer executable instructions for transacting requests over a network comprising at least one physical server wherein said physical server is subdivided into a plurality of logical servers wherein each of said plurality of logical servers is associated with a group of consumer identifiers and wherein said computer executable instructions are configured to route a request, further comprising a consumer identifier, to a logical server whose range of consumer identifiers include said consumer identifier associated with said request.

18. A computerized system comprising a computer readable medium having computer executable instructions for transacting requests over a network comprising at least one physical server wherein said physical server is subdivided into a plurality of logical servers wherein each of said plurality of logical servers may be associated with at least one entity and wherein said computer executable instructions are configured to route a request, wherein said request is also associated with a particular entity, to a logical server whose range of entities includes said entity associated with said request.

19. A computerized system as claimed in Claim 18 wherein said entity comprises a family.

20. A computerized system as claimed in Claim 18 wherein said entity comprises a set of employees from a company.

21. A computerized system as claimed in Claim 20 wherein a second set of employees from said company may be associated with a second entity and wherein said second entity may be allocated to a different logical server.

22. A method for distributing a workload, which utilizes a plurality of physical and logical servers, comprising the steps of:

- receiving a request for work at a processing node;
- examining said request for an identifier;
- determining a logical server out of said plurality of logical servers which has been configured to accept requests associated with said identifier (*selected logical server*);
- determining a physical server associated with said selected logical server (*associated physical server*);
- routing said request to said associated physical server;
- processing said request on said selected logical server;
- monitoring said plurality of physical servers for said workload to exceed a predetermined maximum on any of said plurality of physical servers;
- redistributing a mapping of said logical servers to said physical servers to achieve a workload balanced according to a predetermined formula.

VII. EVIDENCE APPENDIX

None.

VIII. RELATED PROCEEDINGS APPENDIX

None.